VOLUME 84 NO. CP1
APRIL 1958

JOURNAL of the

City Planning Division

PROCEEDINGS OF THE

AMERICAN SOCIETY OF CIVIL ENGINEERS

BASIC REQUIREMENTS FOR MANUSCRIPTS

This Journal represents an effort by the Society to deliver information to the reader with the greatest possible speed. To this end the material herein has none of the usual editing required in more formal publications.

Original papers and discussions of current papers should be submitted to the Manager of Technical Publications, ASCE. The final date on which a discussion should reach the Society is given as a footnote with each paper. Those who are planning to submit material will expedite the review and publication procedures by complying with the following basic requirements:

1. Titles should have a length not exceeding 50 characters and spaces.

2. A 50-word summary should accompany the paper.

3. The manuscript (a ribbon copy and two copies) should be double-spaced on one side of 8½-in. by 11-in. paper. Papers that were originally prepared for oral presentation must be rewritten into the third person before being submitted.

4. The author's full name, Society membership grade, and footnote reference stating present employment should appear on the first page of the paper.

5. Mathematics are reproduced directly from the copy that is submitted. Because of this, it is necessary that capital letters be drawn, in black ink, ⅛-in. high (with all other symbols and characters in the proportions dictated by standard drafting practice) and that no line of mathematics be longer than 6½-in. Ribbon copies of typed equations may be used but they will be proportionately smaller in the printed version.

6. Tables should be typed (ribbon copies) on one side of 8½-in. by 11-in. paper within a 6½-in. by 10½-in. invisible frame. Small tables should be grouped within this frame. Specific reference and explanation should be made in the text for each table.

7. Illustrations should be drawn in black ink on one side of 8½-in. by 11-in. paper within an invisible frame that measures 6½-in. by 10½-in.; the caption should also be included within the frame. Because illustrations will be reduced to 69% of the original size, the capital letters should be ⅛-in. high. Photographs should be submitted as glossy prints in a size that is less than 6½-in. by 10½-in. Explanations and descriptions should be made within the text for each illustration.

8. Papers should average about 12,000 words in length and should be no longer than 18,000 words. As an approximation, each full page of typed text, table, or illustration is the equivalent of 300 words.

Further information concerning the preparation of technical papers is contained in the "Technical Publications Handbook" which can be obtained from the Society.

Reprints from this Journal may be made on condition that the full title of the paper, name of author, page reference (or paper number), and date of publication by the Society are given. The Society is not responsible for any statement made or opinion expressed in its publications.

This Journal is published by the American Society of Civil Engineers. Publication office is at 2500 South State Street, Ann Arbor, Michigan. Editorial and General Offices are at 33 West 39 Street, New York 18, New York. $4.00 of a member's dues are applied as a subscription to this Journal.

AT,BD.CP,CO,HW,IR,SU,WW,PL.

Journal of the

CITY PLANNING DIVISION

Proceedings of the American Society of Civil Engineers

CITY PLANNING DIVISION
EXECUTIVE COMMITTEE
J. Cal Callahan, Chairman; Park H. Martin, Vice-Chairman;
Frederick W. Tuemmler, Everett B. Mansur; James R. Woglom, Secretary

COMMITTEE ON PUBLICATIONS
Nathan Cherniack, Chairman; Donald M. Baker; William H. Claire;
Arthur W. Consoer; Harry H. Hemmings; Myron Hendlee;
Harold M. Lewis; George E. Lommel; Frank H. Malley;
John Nolen, Jr.; Russell H. Riley

CONTENTS

April, 1958

Papers

Number

Some Aspects of Urban Planning
by Sergei N. Grimm 1620

Copyright 1958 by the American Society of Civil Engineers.

Paper 1620 April, 1958 CP 1

JOURNAL

CITY PLANNING DIVISION

Proceedings of the American Society of Civil Engineers

SOME ASPECTS OF URBAN PLANNING

Sergei N. Grimm,[1] A.M. ASCE
(Proc. Paper 1620)

INTRODUCTION

This paper is prepared from notes of the discussions at the Urban Planning Seminar at Syracuse University. The purpose of this Seminar is to clarify urban planning concepts in the light of a growing knowledge of urban geographers, economists, social and political scientists, business administrators, etc. on one side, and urban planning experience on the other.

These sketchy notes were prepared for discussion purposes only and are not intended to be a scholarly treatment of the subject. If they provoke and help to crystallize new ideas about urban planning, the purpose of the paper will have been accomplished. It touches upon the following aspects of urban planning:

Urban Planning in General
Urban Land Planning
Relation Between Land & Transportation Planning
Industrial Land Planning & Regulation
Planning Residential Areas & Local Community Facilities
Regulatory Devices to Guide Land Use & Development in Urban Communities
Positive Means of Effective Land Development.

Urban Planning

Urban planning differs from the planning of an architect, that is, architectural design and site planning, in this principal way: the architect has a specific problem, a limited set of facts, a single client to deal with. His job is to carry out the objectives and desires of that client as far as he can, at the

Note: Discussion open until September 1, 1958. To extend the closing date one month, a written request must be filed with the Executive Secretary, ASCE. Paper 1620 is part of the copyrighted Journal of the City Planning Division, Proceedings of the American Society of Civil Engineers, Vol. 84, No. CP 1, April, 1958.

1. Planning Consultant, City Planning Commission, Syracuse, N. Y. and Technical Advisor, Planning Federation of Onondago County Municipalities.

same time seeking opportunity for self-expression.

Having only one client, the architect has a reasonably good chance of persuading that client to accept his ideas. Town planning is more complicated. However, everybody in a small community knows everybody else and is pretty well aware of group ideals; therefore a small group of leaders may react much like a single client.

In the case of urban planning, an endless number of factors are to be considered, some of them rather involved. Instead of a single owner, or "client", there are thousands. Hardly ever is there a chance to plan anew, starting with vacant land. One must deal with existing cities most of the time. That is what makes urban planning a good deal more complex and much more difficult than planning for a single client, a specific project, or a small town.

Public Administration and Business Administration

Originally "city planning" was either a matter of concern to only a few, or for military objectives, and specific plans were made accordingly. Consider Washington, D. C., for example: from the planner's standpoint its plan, interesting as it is, is no longer an ideal, and the processes now involved in planning a city are entirely different.

"Planning" itself was originally a mixture of zoning and an aim toward what was known as "the city beautiful", and was connected in people's minds with parks, parkways, etc. After years of experience, planners now find their functions essential to and an important part of the local public administration. At the same time, with much private land use being a matter of private decision, there is a growing intelligence and interest in planning on the part of business management. This is particularly true in connection with the location of business and industry.

Public Participation

Instead of plans being "born" in the confines of a drafting room, they come into being in cooperation with many officials and citizens and benefit by the reactions of all of them. An important phase of the Syracuse type of planning is public participation. Plans cannot be "sold" to the people: they must be developed, starting with the people where they are—where their interests lie. One cannot talk land use to them, if at the moment their interest is preempted by expressways, and vice versa.

Overall Planning

In the public mind, physical planning is no more important or significant than fiscal, social, economic or any other phase of community planning. An official planner no longer confines himself to planning the physical city but finds himself part of the community organization. He talks and listens on all phases of community interests. Sometimes a problem he thinks to solve through physical improvements should actually be dealt with through fiscal or social planning.

Elements of Planning

There are several elements in a plan. First of all, there has to be an objective. Syracuse for example, has a plan to restore the natural condition of

Onondaga Lake, through elimination of pollution, to make it safe for recreational use. The undertaking of projects for Onondaga Lake Shore Parkway improvement and the establishment of a sanitary district to eliminate pollution of the lake has been under consideration. These projects are united in a single objective—to restore Onondaga Lake for the use of the people

There have to be "rules of the game"—how to go about approaching or carrying out an objective.

There have to be policies. In connection with such projects as the reclamation of Onondaga Lake, discussion has revolved around the basic policy of who is to do it and how it is to be done. The policy of cooperation among people living in the metropolitan area has emerged and crystallized from years of discussion. Most of this was about cost, and the pros and cons of technical items. The basic policy question was whether the entire metropolitan area should cooperate or whether the city should stand alone.

Another element of the plan is form, its physical expression. One faction backed an independent sewage treatment plan for each municipality. Others wanted a few plants, interconnected. This aspect of the plan shows how form reflects policy.

The ways and means element relates to who does what, who pays for improvement, and where the money is to come from. Syracuse's relatively rough long-range improvement program lists the needed or desirable improvement projects and the sequence in which they should be undertaken.

The time element is important. It may be wasteful or impractical as, in repaving a street before the sewer under its surface is rebuilt, for example. This can be avoided by long-range programming of public improvements.

A final element emerges significant—procedure. So many may be involved in the formulation and carrying out of a plan that it is vital for each to know who is responsible for what, and in what sequence.

Syracuse had talked unproductively about its first big arterial highway project for several years before agreement could be reached with the State as to certain features of the route plan. However, more time was wasted because everybody expected somebody else to take the first step. The stalemate was broken at last by setting down on a single piece of paper what must be done first, by whom and when. It worked.

Planning Process

It is interesting to analyze what takes place in a planner's head. The notion is common that a city planner gets all the data and information from surveys, research and what-not, digests it and somehow comes up with a fullblown plan.

A plan, like a baby, is conceived in embryo. At the very beginning, while research and surveys get under way, the planner begins to generate ideas which he thinks may work. There's nothing wrong with this procedure. It is as fundamental as the conception of a human being, and is known as the "hypothesis method."

In science a tentative hypothesis is formed, and with this in mind, research is begun. Sometimes the research data substantiates the hypothesis, which thereby grows stronger until it seems to be proven. But sometimes research brings facts into play which do not fit. They "poison" the hypothesis, make it look ridiculous. Sometimes it disintegrates before it sees the light of day. Then the scientist must start all over with a new one.

Planners must use the hypothesis method to a large extent, but guard

always against bluffing themselves. They must be prepared to give up an hypothesis if facts begin to contradict it. They cannot afford to brush facts away to protect it. Planners use research and make field surveys to seek facts in support of embryonic proposals. However, there is so much to be learned that planners must make assumptions to fill the gap between facts. When facts are few or complicated beyond analysis, planners assume what these facts would be if obtainable. Having made assumptions, planners proceed to use them in their thinking, and soon they may not sense the difference between fact and assumption.

Technical Operations vs. Policy Making

By making an assumption the planner may drastically influence the conclusion—the plan itself. But the citizens don't know he is guessing. They think he performs a kind of exact science born of precise mental processes. They cannot know the difference that results when a planner chosses one assumption over another. They have no chance to pass upon this choice, even though they pay the price of a wrong guess if he makes one.

The people themselves have a right to guess wrong—for they foot the bill: the planners don't. It is essential to expose the thinking somehow to the public in such a way that they are given a choice. The practical way to make it is by comparing its future effects upon themselves.

Estimating future population is a good illustration of the effects of assumption. Suppose we assume that the rate of population increase will be "so much", and the total in 20 years "a certain number." Thus if a trunk sewer is needed now, it would be designed large enough to take care of the sewage produced by that "certain number" at that future date. If our assumption is wrong, and the population decreases instead, then fewer people are going to have to pay for a sewer built for more people, and the cost may be a real hardship. This variable effect is a possibility in many improvements for which public monies are expended.

In estimating population, we can only gather all kinds of facts and demonstrate that if one estimate is used the cost of an improvement will be this amount; if a different rate is assumed, the cost will be that. If a planner underestimates, the future citizens will have to enlarge the improvement earlier than should be necessary.

The public should be taken into the planner's confidence. Only then they can decide for themselves what they want to do. They have a right to be wrong: their children will "pay the piper."

Stage Planning

Planning an ordinary house seems simple enough, yet the architect goes through a series of steps. He makes a crude sketch of a crude idea. If the client likes it, a preliminary and more detailed plan shows what is proposed with a rough estimate of cost. If the client says go ahead, the architect then makes contract drawings in complete detail, with specifications.

Early planners thought that they could prepare a plan for a whole city in a year or two: a traveling consultant made a survey and prepared a plan which was expected to hold good for ten to fifteen years. Actually, what is applicable to the planning of a house is applicable to project planning and particularly to planning a whole city. One has first to prepare a "general" or sketch plan, then get down to definitive planning of the individual features of it. In the

definitive planning of each feature it is necessary to show how it will look, how it will work, the land it will use, the effect on adjacent areas, the cost, sources of money, etc.

A perplexing thing about planning is that it is impossible to make a comprehensive, coordinated plan in a single operation. Planning arterial routes, schools, playgrounds, etc. for a good-sized community, all at once and in detail, is simply impractical. For example, if certain arteries are built enough population may be dislocated to upset the demand for schools already planned. In short, each plan effects all other plans, and they must be interrelated.

There is a limit to what one can do to anticipate the effects of one plan upon another. This, in fact, is the limitation to all planning. There are effects and an endless number of after-effects, as in a move at chess. How can one estimate the effect of an arterial route system not fully developed for 10 or 15 years? What is to be used for a land use plan in the meantime? There is a limit to the foresight of the most intelligent planner.

Planning principal arteries involves decisions by federal and state governments. Even the timing of such decisions is beyond local control. Local planning must be paced accordingly. Furthermore, in a good-sized urban community hardly anybody except the technicians know all pertinent facts about all parts of the community upon which the plan for the whole community is based. Experience shows that the contents of reports and maps are fully known only to their drafters. Formal "approval" of these is hardly more than a vote of confidence in the technicians. The term "acceptance" in this sense would be more accurate and less misleading to the public.

General Planning + Definite Planning = Master Planning

The early thinking about a "master plan" —a document fixing the arrangement and location of existing and future land use, arteries and major streets, schools and other community facilities—was simply not realistic. The most one can do is set up general objectives and give them as much form as seems sensible, yet be prepared to make changes even before the ink is dry. Objectives themselves must be reviewed and revised every 10 or 12 years. A "general plan" embodying objectives and general forms of a proposed arrangement of community and improvements is exceedingly important as a guide for reference, but in using it one must constantly allow for changes in the situation as they occur.

With this guidance plan, an "Official Map," recording existing and proposed features of the city becomes increasingly significant. In effect, this may become the official city plan.

On this map can be shown location, and possibly those features of the "general plan" which have been sufficiently elaborated in the second or "definitive stage" of urban planning, and approved by the legislative body from time to time with intent to execute them within the next six to seven years at the most. This period roughly corresponds to the period frequently used for long-range capital improvement programming.

Thus urban planning is a continuous never ending operation and urban plans are subject to constant change. Only general objectives can be relatively constant, and even these must be reviewed every decade or so in the light of changes in population trends and in the national and local economic outlook.

Urban Land Planning

Land planning and zoning have been for years virtually a single concept and operation. Land-use classification arose based upon the purpose of land use (residential, business, commercial and industrial) and developed by the originators of zoning. To a large extent the zoning map became a sort of land use plan, providing for future growth of the latter three uses in excess of actual occupancy. However, it largely reflected the existing pattern of land use.

In the meantime geographers, economists, sociologists, etc. carried on studies of their own. As these progressed, it became clear that man's use of land is too complicated to be expressed merely by purpose of use. So complex has this phenomenon been found that these scientists need dozens of maps to describe it, instead of the single map customary in land planning. Business administrators also have developed various "location factors" inexpressible in map form.

As a result of technological progress, the use of land changes constantly—in standards and mode of living, and in the aging and obsolescence of existing improvements. People move within a City, come to it, go from it, are born, age and die in more complex patterns than oversimplified data or total numbers, density, etc. can express. "Decentralization", "the flight to the suburbs" are descriptive but misleading, at least in part. The demands made upon land by occupants, shoppers, employers, employees, etc., together with various physical and social factors, change with time. So do various physical factors. Urban land as real estate is a commodity, subject to the law of supply and demand and other factors of land economics.

Few of these complexities and changeable aspects of land use were visualized by the original zoners and planners. A simple classification seemed adequate to define the characteristics of land use. A picture obtained at one moment in time, by a land use survey, was assumed to be effectively "frozen" thereafter by zoning based on similar classifications.

Meanwhile the term "density of population" began to lose its simple, definite meaning. It was found that in residential areas the number of children and the total population fluctuate over the years. A given number of elderly persons proved to have far different land requirements from the same number and density of growing children. Daylight density, too, differs from night.

The present land planning system, born in the "horse and buggy" age, does not take into account the traffic-generating factors of land use in the automobile era. Yet it is essential to integrate land planning with the planning of traffic, transit and transportation facilities. Traffic-generating aspects are treated piecemeal in the regulations along with drive-ins, shopping centers and miscellaneous off-street parking provisions, without comprehensive analysis of the linkages between land use and transportation.

Land Use Classifications

Classifications used in land planning and zoning relate to the purpose rather than the manner of use. This has led to incongruous situations. A college campus, with its boisterous fraternity boys and its invasions of football fans, is allowed in a residential district. Yet a modern "Electronics Park", with its noiseless operation and ample parking, is condemned to the industrial zone as a "manufacturer". An insurance company headquarters, unobtrustive by day and quiet by night, is "business", while a multi-story

apartment house, with its cars, delivery trucks, blaring radios and other noises, is "residential", i.e. a higher classification. Such inconsistencies make one question the validity of classification by purpose.

Heretofore the effects of use implied by the purpose have been mistaken for the actual effects of the use. The recent development of "performance standards" for dealing with industrial uses is a significant departure from the principle of "purpose". How, not for what purpose, is the practical meaning of this new approach to land use.

Zoning classifications based upon expansion of permitted uses, from the most restricted to the less restricted districts, make the meaning of classifications used in land planning and in zoning vastly different. Somehow classification—a basic but arbitrary tool of analysis—has been mistaken for an absolute yardstick. A careful review of the limitations of classification is needed, and of the way in which classification can be used without impairing the results of analysis.

An experimental survey of the manifestations of land use without classification quickly revealed the effect of night activities on land occupied by large apartment buildings to be as important as in daytime. An origin and destination survey of buildings in a central district showed variance for different land uses, in the number of motorists attracted in a brief period, a few hours, and a hole day. These examples suggest that the more classification is used, the more correct and complete is the resulting picture. At least one classification of land use, for the physical planner, should be based upon the effect of such use on the environment, another upon community facilities necessary to serve that use, etc.

Grading Land Use on the Basis of Environmental Effects

Grading land uses according to their effect on environment would be much more in keeping with public concern about the environmental effect of land use as expressed in the regulation of nuisances and hazards to public safety, health and welfare. In other words, such environmental effects as noise, air pollution, fire hazard, etc. would become the common denominators of land use and of other regulations dealing directly with particular nuisances or hazards. This does not mean that many factors now dealt with by zoning regulations should be overlooked in such grading of land use.

This approach to land use leads to the direct recognition of a series of quality-of-environment levels. In fact, a primary objective of urban land planning should be to provide for such a series of levels wherever people dwell or work, to satisfy the desires and preferences of all of them.

Ordinarily "environment" refers to an area within which a parcel of "used" land is situated, and involves the physical, economic and social aspects of land use. Thus "zone" or "area" bases would not be discarded. It is their meaning that would change. The mechanics to carry out the above objectives would include, among others, the following:

Defining Various Levels of Qualities for Each Level of Environment

In many instances definitions can be general and descriptive, in other highly technical "performance standards". Thus Residential A-1 may define a quality-of-environment level commonly existing in areas developed for and occupied by single homes, with all it implies as to type of structures and grounds, usual appearance, density and relative stability of population.

Compatible Uses

Non-residential uses which might be allowed on several levels of environment could be referred to as "compatible uses". As previously mentioned, compatibility comprises the combined effect of physical, social and economic aspects of land use. Some aspects of compatibility are not susceptible to exact measurement, nor, therefore, to exact technical analysis. Even more difficult is the measurement and analysis of the combined effect of several aspects of a land use. This must be a matter of general observation and judgment. Fortunately the law provides for such situations.

Long before the measurement and analysis of so complex a concept as land use and its various aspects was thought of, certain public bodies were given the power to make findings which the courts themselves cannot upset, except upon proof that a finding was unreasonable. (Even then, the burden of proof is upon those who challenge its reasonableness, more often than not, difficult to do.)

A Planning Commission or Board is a body endowed with this all-important power. Therefore, however far technical surveys and the conclusions based upon them may go, the planning body determines what constitutes a given level of living environment, and what constitutes compatibility in a non-residential use. Since the effect of their findings on the individual citizen or his property may be adverse or not in his best interest, the proceedings leading to these findings must conform with the general principles of due process of law. This means, in effect, that before making findings and enacting regulations accordingly, the planning body must go through the procedure of public hearings with proper public notice.

Care should be exercised not to assume that uses compatible in one area would be compatible in another of the same level of living environment. Dressmaking by a woman in her single-home with a little sign in the window may be completely tolerable in one residential neighborhood, yet utterly unacceptable in a more expensive one. A junk warehouse may be conducted tidily and without more disturbance to the area than any other warehouse, yet some may not want it next door.

The difference between such a use of the term "Residential A-1" and the way it has been used heretofore is that the latter limits an area to use for single homes, while the former indicates an area where the quality-of-environment is maintained at the level expected in a neighborhood of single homes. Meanwhile the uses may vary as long as they are compatible from the physical, social and economic standpoint—i.e., on the same level of quality-of-environment. Some home occupations are frequently allowed in the existing regulations. In fact, the text of these may remain intact. Their meaning can be explained in a preamble to each section dealing with a zoning district.

A series of levels of environment could be defined for uses of land recognized now as non-residential. A modern insurance company headquarters may fit into a higher level of environment than a large apartment building, and a modern industrial plant may be a better neighbor than an institution. Yet an apartment over a store in a business district would be on the level of environment usually found in such a district.

All this does not arbitrarily mean "mixed land use". Mixed uses would exist only in the sense that the uses vary in purpose. It would be a great relief to realize that "mixed land use" is not created simply by allowing a business use in a residential area while freely allowing residential use in a business district.

Grading Land Use According to Its Effects Upon Community Facilities

The effects of land use on community facilities, including street improvements, must be classified separately. The capacity of street utilities and to some extent of schools, playgrounds, libraries, etc. are related to the number of people served (excepting special users.) The capacity of streets is related also to the traffic-generating characteristics of land use.

In designing utilities a per capita basis is commonly used, capacity being designed to assure service at peak load, yet no unlimited sewer or water system can be designed. A large industrial consumer of water, or a hospital, at the remote edge of the system serving a residential area, may call for the strengthening of supply and the enlargement of sewers—at a public expense far exceeding the beneficial effects of that consumer. In some areas, for a variety of reasons including the desire of the residents, so low a density of population is justifiable that sewer service may be either not feasible or too costly.

However crude a classification of use may be, based on density of population (which means roughly "persons, dwellings or their equivalents per acre"), it may still be a substantial help to the economical development and operation of costly public utilities. Similarly, classification by traffic-generating characteristics should make it possible to relate land use arrangement to classified-streets pattern, and to assure the economical development of street surface improvements which constitute a large portion of municipal expenditures.

In classification by density, enough experience has been recorded to furnish a reasonable basis for classification to serve the above-mentioned purpose, yet operate harmoniously with classification based upon quality of environment. For classification by traffic-generating characteristics, a basis should emerge from the rapidly accumulating data of the origin-and-destination surveys and studies of off-street parking requirements, coupled with the advancement of street design and classification.

The above classifications are not all that is needed for comprehending and dealing with the urban community. It sounds paradoxical, but one remedy for the limiting effects of classification is to classify still further.

Other Basic Considerations in Urban Land Planning

"How much land shall we provide for urban uses?" In the past this question was answered by analyzing the community's economic characteristics, i.e., the "economic base", then in the light of estimated future population determining land area requirements. To determine land area requirements for various uses, statistical data on land area or frontage, compiled for cities of several sizes is widely used.

The question of "How much land shall be provided?" is misleading. A number of questions need be asked, the answers to which may give an idea as to how much land is likely to be used.

The first is "What are the community's land resources, because the basic aim is to make the most of these. The economic base is a mere appraisal of economic characteristics and trends. It does not necessarily encompass all the community can accomplish if it makes up its mind to develop its resources, and pursues its objectives with intelligence and vigor. Economic planning must both precede and move with physical planning. There is no clear cut provision for this in present planning procedures.

Curiously enough, under this procedure of "over-all community planning", the estimate of future population becomes a matter of policy—a symbol of objective, rather than a technical guess. In some communities it may be exuberantly high. In others—as in Metropolitan New York where congestion plus a staggering time-travel factor demands practical solution—the policy-makers may wish they could unload some population.

In a community of abundant land resources, the first step is to appraise the adaptability of this land to urban use. This requires an engineering investigation of the feasibility and practicality of land development as regards sewage, drainage, water supply, highways, etc. Then specialists in industrial and commercial development may suggest which land should be made promptly available by the providing of, or the commitment to provide public facilities and services.

In the case of land used for, or feasible for residential use, an inventory of existing supply through housing market analyses (quantitative, qualitative, etc.) need be made. In the light of all these, it should be possible to suggest which lands should be planned for urban residential, to seek commitment for extension of public services, and to zone land accordingly.

Where businesses and institutions depend upon clients, customers, patrons, patients, etc. (already in sight if not in being), it is impractical to set location and amounts of land required beyond analyzing the need of existing businesses and institutions. Specialists in business location have to advise their clients in the light of existing competition, price of land, etc. Planners must harmonize such uses with adjacent areas if they can or, if they cannot, say so.

It is preposterous how planners have mistaken the suitability of land to business purposes for the probability of its successful use. Only recently in connection with urban renewal did it become apparent that land to be cleared cannot be masterplanned for business and zoned accordingly.

Travel-time is an important factor in urban land planning. For an urban community to function effectively as a whole, it is necessary that each part of it be accessible from any other part with reasonable ease. Residents should be able to work anywhere in the urban area. A family should have even quicker and easier access to places they all want to go—the central and other community facilities.

In such an area as the Syracuse-Onondaga County urban community of 400,000, a modern transportation system should make it possible to live in one end of the area, get to work in 20 to 25 minutes, and reach the heart of the City in 15 to 20 minutes. With continued improvement of the system, such travel-time can be maintained even if the area expands considerably. Beyond this, generally the number of people willing to travel farther and longer for the sake of living in a more scenic open-land environment is limited. It is simpler to think in terms of satellites, where some people are satisfied to travel greater distances or where business and employment opportunities are limited to a portion of the total urban area. In distances, this would mean an area of 8 to 10 miles radius if mankind tended to settle in a circle. This is not the case. The natural tendency is for communities to grow along major highways. It is within such an area that land suitable for urban purposes has to be particularly considered, and as long as there is room for urban growth, let it grow.

Practical consideration of public expenditures for various needed improvements and the difficulty of making decisions and commitments are likely to limit the growth in some directions, if not in all. The pattern of the future

community will be a result rather than an objective.

Under the American social economic system most decisions lie in the domain of private enterprise: only a small part of them are reserved to the people as a whole, through government. Perhaps two-thirds of urban land is privately owned. Thus, land use planning means helping private forces to deal with land resources to ultimate mutual benefit, guiding and restricting them only where public interest is clearly concerned. This is mainly in connection with public improvements and services. With growing intelligence among business groups and their personal interest in planning, together with their increasing appreciation of "good community relations", more emphasis must be placed on private land use planning by private owners. Technics and procedures have to be developed accordingly.

To sum it up, the general purpose of land planning is to achieve: (a) various environmental conditions throughout the urban area at satisfactory levels for wholesome living, while relaxing, sleeping, working, or simply existing; (b) an arrangement of land uses assuring economical provision of transportation facilities, utilities and other community facilities necessary for the efficient functioning of the community. All this leads to concepts of "areas" of compatible environmental conditions, and of the geographical relations of such areas among themselves—partly because of their effects on one another, partly because of transportation and other facilities serving several areas or all of them. The latter expresses itself in terms of relative "accessibility", the limits of which vary among metropolitan areas and among various land uses in a given area.

Relation Between Land and Transportation Planning

Confusion regarding the relation between general land planning and transportation planning has caused difficulties and delays. In national programs such as urban renewal or housing, land use and transportation are so interrelated that one cannot tell exactly where one ends and the other begins. In a homely way, it may be described as a "hen-and-egg" situation.

To use land, you have to get to it. Unless one is born on a parcel of land, he has to move there before he can use it. Therefore some highway officials feel that transportation comes first. Others take the view that one must take the piece of land as the starting point, thus putting land use first, Out of this simple difference a number of practical problems arise.

Highway officials feel that people will move where roads are built. Land planners feel that roads should be extended to where people are or will be. Highway people may decide to run an arterial route through an obsolescent residential area, with the idea that this will bring about a nice commercial or industrial district. Land planners may have reason to believe that the same area should continue to be used for residential purposes. The task is to bring the two together.

The urban planner needs the combined view. He must be sympathetic to both approaches and see the situation, one might say as "ham-and-eggs" instead of "hen-and-egg". Land use and transportation are separate in terms, but are actually two functional aspects of a single broad concept of urban living.

Highway engineers seem primarily concerned with the movement of long-distance traffic once on a highway or expressway. City officials view expressways as a means to expedite total traffic movement, by utilizing a combination

of all traffic facilities including expressways. The two objectives are not the same.

To highway officials "design speed" is a more or less fixed standard: to urban people it is merely an incidentally desirable goal, to be obtained as nearly as possible in expediting the entire movement over the network of traffic facilities including expressways. One means fewer points of access, the other many. The design standards of urban expressways are established by highway specialists with little contribution on the part of urban planners.

Land economists recently brought into use a new concept, "linkages". They analyzed land uses in terms of linkages among various land areas and their various purposes. From home, for example, people go to their places of work: this is one "linkage" of that residential use. From home they may go shopping, or to visit friends. From a store they may go home or to other shops. They may deliver goods there, or ship goods and merchandise from there elsewhere. All these are linkages among parcels of land use.

Traffic specialists went into action on their own. To deal with traffic phenomena, they began to measure traffic volume at first by count. Then they learned that in order to plan highways, they needed to know the origin and destination of traffic—again the relationship between two parcels of land, one originating a trip, the other receiving the passenger or goods.

An article describing a Chicago metropolitan area transportation study points out that such a study might determine how occupants of various parcels of land contribute to the movement of traffic on street and sidewalk. In such event, it may be possible to dispense with origin and destination surveys, which are costly and time consuming.

However, origin and destination data does not mean much in the case of vacant land which may be developed after the survey or in the case of land where the use may later change. By some means, future land use must be taken into account in planning future streets and highways.

In the past the highway planner, like the planner of sanitary sewers and water supply, made assumptions of his own regarding possible additional load on the facilities they planned, trying to allow for vacant land development and changes in the use of areas already developed. Each assumed what future land use might be, sometimes utilizing the land planner's ideas.

It was not uncommon for the planner of one facility to think his guess as good as the next fellow's, including the land planner's, so it is not surprising that planners of expressways and arterial routes have not worked in harmony with land planners.

The solution to this problem seems to lie in the following analysis of the planning process, which must at the same time reflect the effects of all other planning—highways, sewer, water and drainage facilities.

In all phases of planning are successive steps of technical analysis, of facts and engineering data on one hand and policy decisions on the other. Some assumptions must be accepted by policy makers before they can safely be used by the technicians in arriving at final conclusions. For example, the feasibility and probability of a land development requiring water supply systems and sewers can be judged only by the local public bodies concerned with zoning, who have the authority to pass this judgment. Some aspects of highway design, such as standards, may fall within the jurisdiction of an upper level agency of government.

It should be possible, however, to list all the technical operations and policy decisions involved in land and highway planning in sequence, and to indicate

whose responsibility is each decision necessary before moving to the next step. Usually the law defines responsibility fairly well: if not, it can be clarified.

All this adds up to "procedure". Procedure is an important element of the planning function, yet its importance is the least recognized—especially where more than one person or agency, or more than one level of government is involved.

Industrial Land Planning and Regulation

To the urban community industry is what field, pasture and barn is to agriculture. The successful operation and growth of industry cannot help but be of special concern to the community.

As farming depends upon weather, good "business climate" means much to industry. It is through greater understanding of industrial development and operation that such concern can be expressed and thus contribute toward a better business climate.

Industry is organized and functions largely within the domain of private decision. Upon a decision regarding location of a new plant may depend the success or failure of industrial enterprise. Such decisions are the result of judging the facts pertaining to the location. In exercising such judgment, the industrialist must himself weigh facts regarding the prospective site and the many other matters pertaining to his enterprise and its future. It is hazardous to prejudge which industries are likely to locate in an area and what their site requirements may be. Virility, vision and opportunism in management can greatly vary the weighing of site factors.

With constantly advancing technology and means of transportation, it is not practical to assign to industry the low land along railroad tracks, as was customary in early planning days. It is important to have an ample choice of transportation facilities and their combination, on level or gently sloping land, although well-drained land on steep hill sides may be needed for special operations requiring an underground location.

It is impossible to tell how much an industry may require of utilities, water, sewer, gas and electricity. Some industry may get by with a minimum quantity of water, for purposes other than manufacturing. Others may need large quantities. Sometimes raw water from streams will do, and may be recoverable for return to the same stream or to another. Sewage and industrial waste disposal needs vary, depending upon the quantities of water used. Gas is needed by some industries, but not by all. Electricity is used by all, but in varying quantities.

What the community can do toward planning land use is to set aside as much land conceivably adaptable for industrial use as its resources may allow without unduly limiting land needed and suitable for residential and other purposes, and without interfering with such arrangement of all land uses as necessary for mutual accessibility and servicing. In addition, the community must make sure there is ample choice of sites for immediate use with facilities and services available. This means facilities either existing, or the prompt provision of which is assured by the necessary policy decisions and financial ability.

On available sites, factual information as complete as can be assembled should then be readily available to potential industrialists for judgment and decision.

Many industrial establishments are likely to locate in close proximity to residential and other non-industrial areas bringing problems in connection with possible effects upon such areas. Earlier concepts of industrial land use were based on a general idea that industry is a source of nuisances—air pollution, excessive noise and unsightly appearance of buildings and grounds.

In larger cities manufacturers cared little for their environment or how their own establishment looked or functioned. In some smaller communities, where people working in industry lived near their plants, industrial structures were either embellished or draped with ivy to blend with residential environment in some degree. On this premise, in earlier planning days, areas to be used for industrial purposes were confined to such locations as those already used by industries and those in proximity to railroads (which were a source of nuisance themselves with engines belching smoke and soot).

Since those early days many changes have taken place in the design and operation of industrial establishments as well as in the concepts of land planning and zoning. An even greater change has come about in the thinking of industrial leadership. The elimination of odor, smoke, noise and other nuisances, and the improvement of plant and site appearance have been recognized as not simply desirable, but essential for successful operation in modern industry. At the same time, some particularly spectacular nuisances, such as excessive smoke and odors, have been eliminated both through the enactment of public regulations and technological improvements such as substitution of power-sources, as from steam to electricity; the development of practical devices controlling smoke and odors at the source, etc.

However, during the same period, new sources of nuisances and disturbance to residential uses were developed with the growth of automobile and truck usage. The vast concentration of employees at some industrial plants, and the ever-increasing dependence on trucking have made this undesirable condition an important factor in planning for industrial locations. Since heavy traffic movement, both passenger and truck, has other significance besides its effect on residential areas, it is a matter of general traffic-facilities planning.

This factor must be considered in connection with the planning of traffic facilities. On their own part, industrialists are aware that facilities for the speedy movement of the traffic they generate is essential. If they were not, trucking concerns servicing them would tell them.

With the changes in the mode of industrial land use and in the general attitude of industry itself towards its environment, the question is how industrial land use planning must reflect these changes. The answer is in performance standards based upon the measurement of the various disturbing effects of industrial land use on its general environment. Utilizing such standards it should be possible to establish industrial areas of different levels of quality of environment. It is difficult to impose such standards through public action in smaller municipalities which lack experience in setting up, enforcing and complying, especially in matters of appearance and general tidiness, among the important attributes of modern industrial development. For this reason, as a first step toward performance standards, there should be at least two categories of industrial district: restricted and general.

In the restricted districts, only uses relatively free of noise, odor, smoke, dust and other nuisances would be allowed. Listing of specific kinds of industry may be used, as is done at present, but the intent would be to convey the idea of functional effects rather than purpose. This intent would be clearly stated in a preamble.

In addition there could be provision for "planned developments" in which proposed new developments, or improvement of areas occupied by existing establishments follow a definite plan conforming to the standard requirements of a restricted district. The land use in such planned developments would, upon approval of plans and standards by the appropriate public body (following the same procedure as in amending zoning regulations), be allowed according to such plans and standards. The standards for such planned developments would have to be proposed by the developers and industrialists themselves. As a result the maintenance of these self-imposed standards could be left largely to the property owners.

Able to rely upon industrial developers and industrialists to raise the level of environment of industry in restricted districts, public bodies may concentrate on the more effective regulations of those unnecessary nuisances and hazards in general industrial districts which constitute a detriment to residences as well as to other industries.

Some regulations, such as a smoke abatement ordinance, need to be general (i.e., not a part of zoning) and preferably uniform throughout the metropolitan area. Health, sanitary and other specialists, rather than planning, zoning or building experts and administrators are needed to set up and enforce such regulations.

Harmonizing Industrial Uses with Other Land Uses

Public bodies have a duty, to residential and industrial users alike, to work out the problem of incompatibility between them. Devices of transitional zoning and "buffers" of various types are available for this purpose and should be spelled out in the regulations. These and similar means should make it possible to find room in some part of the county for every legitimate industrial activity.

It is important to keep in mind that some devices for harmonizing industrial uses with other uses are possible only through the use of public powers. This is particularly true of industrial traffic and parking, which have become the principal nuisances of industrial use, especially in the congested areas. These nuisances can best be abated by creating ample sites for industry on highways and streets planned and built to accommodate heavy traffic.

Zoning has been regarded as the principal device to prevent "spoiling" an industrial site by the use of all or part of it for other purposes, particularly residences. In some of the recent zoning regulations, residential uses are prohibited outright in some industrial districts, especially those intended for "heavy" industry.

There are two distinct premises for considering such prohibition of residential use. One is that living in the environment of industry is detrimental to health, safety and welfare. The other is that home building in an industrial area interferes with the future industrial development of that area.

The first premise may be valid where a home is near an industry producing effects detrimental to living. This is a matter of health and safety. However, other regulations such as the housing code may apply directly to prohibit residential occupancy. In vacant industrial areas, there may be no facts to forecast possible detriment to the occupants of a house. Speculation must enter in, to the effect that an industry might sometime occupy adjacent land and that its operation might prove detrimental.

The other premise—that an industrial site must be protected from being

"spoiled" by home-building—may be even more difficult to employ. It would be necessary to prove that no other location is available for the industrial plant. The suggestion may also be raised that a small business or even a small industrial building on the site might interfere with another industry's use as much as would a house.

Altogether the protection of industrial sites by zoning through prohibition of residential use, is different from the protecting of future inhabitants of homes that may be built between two or more heavy industrial establishments and should be approached with a great deal of caution. Other tools may be less direct yet more effective if used in combination with zoning.

The subdivision of land for residential purposes would be discouraged by requiring ample protection against the unfavorable effects of possible adjacent industrial use in the future. In the case of scattered single homes, extra large side and rear yards might be required. Refusal to accept new streets for dedication may arrest residential growth. Reluctance to cooperate with home-builders in connection with the extension of water mains, sewers, etc. may also help in the areas planned for industrial use. How far these devices should be used depends upon the actual circumstances of each situation.

All this is feasible only where there is a sufficiently strong local determination to reserve the land for industrial development. Effective planning and the provision of facilities in areas intended for residential uses is the best way to prevent home-building on land reserved for industry. Increasing control of building construction should offer opportunities to guide would-be builders to appropriate locations. Prohibiting a property owner to use his land for home-building must be based on strong facts, not on speculation. Reasons of health and sanitation may be more effective than arguments favoring the preservation of an industrial site.

Zoning can be used in two ways to protect vacant industrial areas against being preempted for less important uses: (a) Zoning for industrial use the potential sites for which street improvements and utilities are available or definitely assured by official commitment; (b) Zoning undeveloped land as "open land" districts (known also as "agricultural districts") where only farming and scattered residential uses are usually allowed, but where other uses, including industrial, may also be permitted under certain conditions, through special proceedings. The public should be made aware of the possibility of such development by appropriate designation of potential industrial land on the general plan of the municipality.

The choice between these two methods depends upon the advancement of planning and on provision of drainage, water supply and sanitary sewage disposal systems. There is no point in zoning as industrial such areas as extensive swamps at least until drainage is provided or assured.

Planning Residential Areas and Local Community Facilities

One step in the analysis of an urban area's land use, major arteries, and streets is the scrutiny of the residential areas formed by natural barriers and major thorofares.

The object of this is to ascertain how to keep through-traffic out of such areas and so arrange street pattern as to assure adequate circulation in relation to major arteries and streets. This phase of planning has been greatly complicated by the injection of a special objective—to make such areas self-

contained units or "cells" of the urban community. That is to make a series of "communities within a community" where the inhabitants could live very much by themselves, using facilities provided within each unit. When this results from favorable circumstances peculiar to a residential area it should be welcomed, but excessive emphasis on the self-contained "cell" complicates the urban planning process.

The complexity of the urban organism is too great to analyze it or guide its changes and growth by limiting one's thinking to any cellular pattern. Yet for several decades such limitation has influenced planners' mental processes.

Some years ago after extensive study of New York's lower east side, Clarence Perry concluded that to overcome the evils and drawbacks of a large city, where the individual is apt to be lost and social organization disrupted, it would help to provide a physical framework within which that individual could meet his living problems with the moral support of his neighbors. Thus he formed the concept of the Neighborhood Unit.

Perry believed that the principal feature of an area, controlling its size, should be an elementary school, and he obtained from educators the efficient capacity of such a school. The density of population common to New York indicated that an area so small that through-traffic could by-pass it would support such a school.

This appeared to be the perfect unit—a school within easy reach of adults as well as children, a surrounding residential area, and through-traffic excluded. A playground and a shopping district to serve the area were also incorporated into the Neighborhood Unit concept by Mr. Perry. His idea was that such a setting would encourage neighborhood organization, providing support to those people lacking in the background and environmental adjustment to make them good and happy citizens.

The idea spread rapidly among social workers and city planners. From a physical standpoint it offered designers a splendid opportunity to draw interesting and appealing plans. What happened next, outside of a few special situations, can be illustrated by Syracuse experience. The idea proved a hindrance rather than a help in Syracuse-Onondaga planning.

During Post-War planning, celebrities from all over the United States came to help. Every effort was exerted to follow Perry's ideas but the results didn't make sense. The distinguished advisors made sketches of "typical" areas. With certain compromises, such as allowing major streets to run through a few trial areas, some areas large enough to support a school were delineated.

But when attempts were made to continue this throughout the City, it didn't work. It was finally concluded that, while New York with its high density could plan such a unit in a relatively small area, the much lower density of a city like Syracuse (except in the most congested areas) would call for a school radius so large that through-traffic would have to be maintained. In the suburbs, the area served by an elementary school must be so large that school buses would be necessary.

It was discovered that smaller communities actually grow outward from "main stem" highways as developers take one property after another, and that frontage is first developed along main transportation lines, and side roads afterward. Major thorofares provide the backbone, so to speak, of the residential development of our communities, instead of encircling them: arterial streets had to pass through residential areas to pick up the traffic.

The demand for homes is so spread throughout the entire urban area that—

excepting at the peak of a residential boom—it is feasible to build only a limited number of homes in any particular section, lest overbuilding result. One cannot build an unlimited number of homes in any one direction in any one year. In short, the manner in which residential areas grow is the reverse of that necessary to bring about the Neighborhood Unit of Clarence Perry.

It was also found that in planning local community facilities, the most efficient area of service may be different for each. For sewers the drainage area is most efficient, because it allows servicing without expensive pumping: this is a limitation imposed by topography. Demarcations of telephone service areas, merchants' delivery areas, etc. differ. The drainage area and the school area do not coincide. For practically every facility and service, there exist conditions limiting its area of efficiency.

Then—how far does the physical and social neighborhood influence life today? Clarence Perry could not foresee the full effects of telephone, automobile, radio and television in expanding the opportunity for contacts among people with a common interest. Apparently a cul-de-sac or single street-block is about as far as old-fashioned "neighboring" is practiced today. Whether people live two blocks apart or 20, they belong to the same church, lodge, veterans' post or bridge club; they play golf ten miles out of town, or join a country or social club anywhere within reach of automobile. Some 1500 organizations—social, cultural, patriotic, philanthropic, etc.,—exist in the Syracuse urban area alone.

There was found great fluctuation in attendance, even at schools in already built-up areas. Families move in and rear their families; when their children are grown, some parents remain until a new generation of families moves in with its children. Sometimes the area served by a school must be expanded to insure full utilization; sometimes a school has to be abandoned. New schools can be planned only in the light of the age, capacity and extent of utilization of existing schools, modified by the anticipated demand in areas still in the development stage.

School authorities can see ahead five or six years at most—in some instances, not that far. It is impossible to foresee how long a residential building boom will last or what land may come under development. The demand is drastically affected by the establishment of private schools in the area, by decline in residential construction, etc.

When demand for a school appears to be quite certain, a site is tentatively selected, perhaps even acquired. Any long-range attempt to spot locations for future schools throughout an urban area would be based on so many unwarranted assumptions that it would be worth less than an intelligent guess. Such long-range planning would impede clear thinking and prompt action in ever-changing situations.

The same dangers are inherent in planning outdoor recreational facilities, excepting in built-up areas. In open areas plots of land for new schools are usually sufficiently large to provide playground or playfield. However, in suburban areas children must often be transported to classes by bus, but no such service is extended to playground use. Supplementary community parks and playgrounds must be planned much like schools; that is, by keeping ahead of residential development without depending too much on guesswork.

In his second book, Clarence Perry's thinking extended somewhat beyond his first theories. Here he advocated the organizing of the building industry to handle very large projects, and the bringing into play of the power of eminent domain to assemble land. This would mean complete reorganization of

the home-building industry. Even were this done, the limitation of housing demand would devitalize such an arrangement in smaller cities. Housing economics were unrecognized in Perry's day.

To guide new residential real estate development on a tract here and a tract there the operators must be coordinated. Public concern for proper sewage and drainage, water supply, and roads gives an important opportunity to officials to work together in shaping land development. However, not much can be done about timing and total growth of residential areas, or the sequence of development of individual parcels. Laying out in advance and protecting the future rights-of-way of important streets, drainage channels, etc. become a necessity.

It is remarkable how deeply the ideas of Clarence Perry became imbedded in the thinking of many planners. His concept became a part of the common "lingo" of planners and their sympathizers, and even crept into the language of the laws. Some planners have given up the "social neighborhood" idea, but continue to think in terms of "physical neighborhood", and recently one hears the term "industrial neighborhood". All this is a long way off from the social-purpose concept of Clarence Perry, who did not claim to be an expert on land use and transportation.

Of the original idea, physical planners have retained only the empty shell. What is left of the social neighborhood concept is the subject of study by social planners. This, perhaps, means the general need of a person lost in society—the need felt by a human being not sufficiently resourceful to fit into the groups around him, a newcomer to a strange city, lost and lonely in it. This need, which Clarence Perry, like many others, tried to solve, by the short-cut of mere physical arrangement, calls for social research and social planning. In justice to Perry's splendid beginning, the social planners should take up where he left off.

Physical planners may well concentrate on so planning residential areas as to free homes from the effects of through-traffic, either by diverting it from residential streets, or by letting it go through and protecting those homes by devices such as proper street classification and design. Let them plan schools and other local community facilities for efficient service and assure safe access to them by children of various age groups, without a preconceived notion of dictating the size or shape of residential areas.

It is hard enough to plan the city of the future—its land use, traffic facilities, community facilities, the replanning of the existing city. There is still little known about the urban community and even less about its future. To place a screen or framework of neighborhood units in the line of vision merely straitjackets the already limited capacity to help people to better urban communities.

Regulatory Devices to Guide Land Use and Development in Urban Communities

The people who make up a state have vast powers with which to endow certain public bodies and officials, among them the power to regulate the use of land, directly and indirectly. These powers are delegated with defined limitations.

Certain bodies must be established and officials selected to do organized business. These bodies and officials cannot arbitrarily dictate how a land owner is to use his land. They must follow the orderly process prescribed by

law. Thus, the people are protected against arbitrary official action regulating the use of their property.

Under the principle of "due process of law", public notice must be given by the local public body and a public hearing must be held before private property is taken for public use. Even the number of days notice required is so prescribed. Under another principle, no property can be taken without compensation: no property can be confiscated, directly or indirectly, by a local public body.

However, several powers are available to localities in dealing with land. One is the power of eminent domain, i.e., of taking private property for public use. Another is police power: appropriate public bodies can regulate land use in the interest of public safety, health and/or welfare. Still another is the power of taxation. By taxation, property owners may be gently pressed to do things they cannot be forced to do. An owner withholding land from development, thereby causing the uneconomical use of existing public facilities, may by the raising of assessed valuation be made to develop his land or sell it to someone who will. All these powers should be used, but reasonably and fairly.

Land Subdivision

Zoning regulations, building codes, anti-noise, smoke abatement, fire and sanitary regulations, electrical codes, etc., are all exercises of the above powers.

Land subdivision regulations differ from the others in that the public is directly concerned in the future of public streets, street improvements and community facilities. Originally, much land was subdivided into lots without any idea when the houses would be built or when street improvements would be required. Such premature subdivision, in advance of actual need, proved unsatisfactory to everybody—buyers, bona fide developers, and those municipalities which carelessly assumed responsibility for bonds financing street improvements for which lot owners could not pay.

Subsequently, legislation was enacted requiring developers to install street improvements, or to provide a surety bond covering their cost, before acceptance of these streets by the municipality. This, added to the concern of the businesses and financial interests involved in residential building, brought about a situation where land subdivision became part of residential development, almost as if the two were one project.

Early land planners were primarily concerned with street layout, connection with streets beyond the subdivision, street grades, and lot sizes and shapes. In recent years, however, the emphasis of public concern has shifted to water supply, sewage disposal, drainage, street improvement, etc., and the financial problems involved. Many of these problems must be dealt with on a larger area basis than a proposed subdivision covers. Thus primitive land subdivision planning grew into a complex engineering problem.

This does not mean that the public is no longer interested in the attractive layout of residential areas. It does mean that here, as in the case of building construction, the administrators of building codes and land subdivision regulations are not concerning themselves with the looks of houses. Men in land subdivision control must be careful not to overstep the limits of direct public concern or impose their personal taste or notions of development economy upon developers.

Long before land subdivision regulations came into being, various highway

officials and local public bodies had jurisdiction over some phases of street development and over the financing and construction of various street improvements and local community facilities. Municipal bodies and officials have general responsibility for establishing a highway, fixing its exact location, grades and standards of construction, acquiring right-of-way, providing or acquiring street improvements and utilities, and financing them as a general municipal charge or otherwise. Even the planting, location and maintenance of street trees is under the jurisdiction of certain officials. Providing local community facilities such as schools, parks, playgrounds, etc. have also fallen within the jurisdiction of certain bodies.

Other matters pertaining to residential development are within the jurisdiction of higher level agencies of government. In New York State, county and state departments have certain responsibilities in connection with residential land development.

Altogether, public responsibility is vested in a large number of agencies and officials. Some requirements pertaining to residential development are or should be incorporated into the regulations of one agency rather than of several. Perhaps some requirements should be regulated by other agencies than those providing for them now. The only way to assure orderly regulations of residential land development is through a set of comprehensive regulations covering all its phases.

Since the participation of many agencies and officials cannot be avoided, an important part of such regulations is procedure, clearly defining the agencies and officials concerned and their scope of jurisdiction, and describing the sequence in which their responsibilities must be exercised. Without procedure, public officials—including planning bodies—are likely to do more work to less purpose, while the private developer tangled up in "red tape" wastes time which could be better used in producing more economical and more desirable development.

Usually such regulations as those controlling smoke abatement and fire or sanitary hazards deal directly with specific nuisances or hazards to public safety, health and welfare. In this sense they may be referred to as direct regulations.

In the case of zoning, many uses are regulated on the assumption that they are usually accompanied by a nuisance or a hazard. Actually this may or may not be the case, especially if the direct regulations dealing with them are adequate and properly enforced. Somehow, a person interested in one type of regulations, more often than not, believes that those in which he is interested are likely to be enforced, the others perhaps not. If anything, direct regulations dealing with specific nuisances should be easier to enforce than such general land use regulations as zoning. It seems to be easier to force the owner or occupant of land to eliminate smoke nuisance than to stop using land for industrial purposes. Actually, all the regulations of a municipality (excepting the statewide, such as the New York State multiple dwelling law) could be put into one book, each chapter covering a regulation. Such books are known to exist. In Syracuse the Zoning Regulations were made a chapter of the Building Code, for more effective administration.

In drafting zoning regulations one could not presume more effective enforcement of one paragraph than of another. Similarly, the drafters of one set of municipal regulations, such as zoning, should not presume that other regulations will be as vigorously enforced as these.

Altogether, it poses the rather big question of whether or not any regulations can be drafted without full knowledge of all others in force, or the even larger question of whether or not to consider the review and amendment of existing regulations, as well as the enactment of some desirable ones not yet in existence, before providing for these in the draft.

In the case of junk businesses (generally regarded as breeding rats), sanitary regulations requiring periodic extermination might reduce the rat hazard to a point no greater than that of many business or commercial establishments permitted in business and residential zones. In such event, a junk business confined in an enclosed structure might be allowed in presently prohibited areas. If sanitary regulations have no such provision, perhaps it can be promulgated and supervision provided by experienced inspectors. If there are no sanitary regulations and it is impractical to enact them, provision could be made in the regulations adapted in connection with the licensing of junk yards.

As a last resort, one might consider providing for adequate extermination in the zoning regulations. However, in such a case the cost of the necessarily frequent inspections would have to be met by the municipality whereas under a licensing system this can be included in the license fee. (Incidentally, the device of license fees for certain land uses requiring more than a normal effort of enforcement with a charge added covering adequate inspections, seems to offer more possibility of the effective guidance of land use than does zoning alone.)

One might raise the question—how can comprehensive regulations, embracing all the regulations dealing with some land use activity, be used by laymen and by the administrative officials concerned? The answer to such a question is already provided in the formulation of "housing codes". These codes, more often than not, are mostly compilations of those provisions of existing regulations which relate to housing. One could have similar "codes" or excerpts from them for such groups of land uses as industrial, commercial, business, etc., or for various groups of land users such as home owner, merchant, industrialist, etc.

Apparently confusion exists among those concerned with various aspects of land use; land planners believe they regulate only the land—the buildings or other improvements being something separate and transient. Building Inspectors are primarily interested in buildings as structures. Still other officials see the "occupancy" in land use. The simple term "land use" means all of these.

In the past, planners have not shown much concern for enforcement, even of the regulations they draft. It does not seem consistent to follow the planning of physical improvements through to the point of preparation of capital improvement programs (the consideration of ways and means), yet in case of regulation stop at the drafting of devices. Regulation of land use, to be practical, must anticipate the feasible extent of enforcement. It is possible that some regulations should be combined with the licensing of use while some should be under the jurisdiction of another body than the planning office, or perhaps should not be adopted at all. If the administration of individual regulations were placed under a single jurisdiction, it would greatly expedite the integration of zoning and other regulations into a set of comprehensive regulations of land use. New York State law provides that a town may name a Building Inspector whose job it is to attend to all the town's regulations.

It is interesting to note that in connection with Urban Renewal activities there is growing concern over the variety of regulations. This should lead to

a comprehensive approach to a system of regulatory devices and, it is to be hoped, toward a similarly comprehensive approach to their enforcement.

Positive Means of Effective Land Development

Regulatory devices such as zoning are negative in the sense that they limit a man's use of his land, sometimes rather arbitrarily. However, positive devices exist to enable and encourage development along the lines of public objective.

Some such devices are provided through various legislative acts, ranging from financial aid to the making available to certain private groups (as utilities) the benefits of the public power of eminent domain.

Inducements offered to private enterprise to achieve public purposes are numerous. Some of them are:

Real estate tax exemptions and concessions (such as New York State aid to limited dividend corporations);

Long term low interest loans (such as New York State middle rental housing aid);

FHA mortgage and "yield" insurance to assure availability of capital funds on favorable terms;

Loans on favorable terms (such as HOLC and RFC, Land Bank Loans);

Income tax concessions in the form of accelerated write-off for depreciation (such as that used for "defense plant" financing);

Exemption from corporate taxation of such corporations as cooperatives;

Making sites available for development at a low cost (such as under urban renewal legislation);

Capital grants or outright public financing of phases of activity which only the government can perform (such as installation of street improvements in a site of proposed development). These have the advantage of simplicity: they are easier to understand and to administer.

Many obstacles hamper the full use of positive devices. To assure compliance with public objective and the proper use of public aid, too many controls are sometimes imposed. These are expressed in regulations promulgated by the administrative department or agency responsible for their administration. Regulations vary in stringency, depending upon the nature and extent of the public aid provided. Sometimes this is such that private groups are reluctant to get involved in a project made possible by the enabling legislation. Some governmental red tape is unavoidable and justifiable, but it deters the free entry of private enterprise into new fields of activity. For example, excessive controls and red tape have discouraged the use of public aid available under the limited dividend corporation laws such as exist in New York State.

Sometimes a need for public betterment is discerned by citizens unfamiliar with business ways. Legislation formulated by these inexperienced people, although intended to attract private enterprise and enable it to meet this need, is sometimes incompatible with the practical conditions under which private business must operate. For example, "yield insurance" of modest rental housing mortgages was devised to attract such investors as insurance companies into this phase of housing development. It failed to do so. Under Urban Renewal programs, public aid for private redevelopment (through "write-down" of land cost) is so arranged that it results in an enormous amount of

public aid and time-consuming red tape. These stand in the way of the effective redevelopment of obsolete urban land.

Public desire to "do something" about the existing condition of urban areas is apparently greater than public understanding of the operation of private forces (the action of which, originally, developed those urban areas), and of the inducements and minimum safeguards needed to assure a better job by these forces, this time. Greater understanding of the operation of private forces before defining the ways and means to public objectives might result in an entirely different form for the aids and controls that guide private forces in the direction of public objective, and safeguard public interest.

Even where legislation is effective, the problem remains of making its benefits and opportunities known to and accepted by business interests. The problem is to fit the new ideas into the old grooves of habit. New concepts must be related to and expressed through existing ones. Nobody considers adding a gadget to a "Univac without making sure it fits. Why expect man to be different? Even so well known a device as FHA Mortgage Insurance took several years to win acceptance by conservative bankers.

However sound and practical a new idea may be, it is a big job to give it proper form and "sell" it to the appropriate people. There is no provision for this at present. Tremendous confusion has come out of the invention of a single new term—"urban renewal"—which is only a set of already existing private and public functions. Only its objective is new.

Where legislation is required to aid private enterprise in meeting a need, something like this happens: a civic group discerns a need unmet by private enterprise, conceives its own idea of means to enable private enterprise to meet this need, and proposes legislation accordingly; from this point, discussions center largely around form and administration leaving limited opportunity for the ideas of experienced private enterprise.

Frequently the need and the initiators' proposed answer become so blended in their minds that they resist other possible answers. Whether or not this situation develops, commonly after a bill is enacted only its sponsors and some who realize the need pay any attention to it. Beyond these few, it simply stays on the shelf in the law libraries.

A few business people, alert to new ways to make money, will avail themselves of the opportunity. Most business people, however, remain ignorant of it. Their lawyers cannot keep track of all new laws, unless the clients ask for a search into them. Trade and business publications try to report new laws of interest to their groups, but it is a matter of chance that some grasp the new opportunity at all. As a result, the potential of private enterprise is only partially tapped.

The same is true of private enterprise in non-profit groups, which might be particularly effective in legislation of significant social value. A variety of non-profit corporations are part of the American scenery, from mutual insurance companies and savings banks to a multitude of social agencies organized under corporation laws.

Enormous community resources of leadership are drawn into the boards of such agencies from business and the professions. Some legislation favors non-profit corporations as more dependable in carrying out the public objectives of legislation, without misusing public aid. At present many civic organizations support various programs of community improvements, but few of them convert their interest into businesslike action.

If all the forces of private enterprise were brought into active play, they

would bring with them a resourcefulness, ingenuity and drive which cannot be fully effective under the limitations of governmental operations. The knowledge of business management experts, business analysts, business psychologists, public relations experts, etc. should be very helpful in devising methods and technics to achieve the effective use of private forces. The bringing into full operation of the resources of private enterprise, in the development and redevelopment of urban communities, would be like releasing atomic energy.

PROCEEDINGS PAPERS

The technical papers published in the past year are identified by number below. Technical-division sponsorship is indicated by an abbreviation at the end of each Paper Number, the symbols referring to: Air Transport (AT), City Planning (CP), Construction (CO), Engineering Mechanics (EM), Highway (HW), Hydraulics (HY), Irrigation and Drainage (IR), Pipeline (PL), Power (PO), Sanitary Engineering (SA), Soil Mechanics and Foundations (SM), Structural (ST), Surveying and Mapping (SU), and Waterways and Harbors (WW), divisions. Papers sponsored by the Board of Direction are identified by the symbols (BD). For titles and order coupons, refer to the appropriate issue of "Civil Engineering." Beginning with Volume 82 (January 1956) papers were published in Journals of the various Technical Divisions. To locate papers in the Journals, the symbols after the paper numbers are followed by a numeral designating the issue of a particular Journal in which the paper appeared. For example, Paper 1449 is identified as 1449 (HY 6) which indicates that the paper is contained in the sixth issue of the Journal of the Hydraulics Division during 1957.

VOLUME 83 (1957)

APRIL: 1196(EM2), 1197(HY2), 1198(HY2), 1199(HY2), 1200(HY2), 1201(HY2), 1202(HY2), 1203(SA2), 1204 (SM2), 1205(SM2), 1206(SM2), 1207(SM2), 1208(WW1), 1209(WW1), 1210(WW1), 1211(WW1), 1212(EM2), 1213(EM2), 1214(EM2), 1215(PO2), 1216(PO2), 1217(PO2), 1218(SA2), 1219(SA2), 1220(SA2), 1221(SA2), 1222(SA2), 1223(SA2), 1224(SA2), 1225(PO)[c], 1226(WW1)[c], 1227(SA2)[c], 1228(SM2)[c], 1229(EM2)[c], 1230 (HY2)[c].

MAY: 1231(ST3), 1232(ST3), 1233(ST3), 1234(ST3), 1235(IR1), 1236(IR1), 1237(WW2), 1238(WW2), 1239(WW2), 1240(WW2), 1241(WW2), 1242(WW2), 1243(WW2), 1244(HW2), 1245(HW2), 1246(HW2), 1247(HW2), 1248 (WW2), 1249(HW2), 1250(HW2), 1251(WW2), 1252(WW2), 1253(IR1), 1254(ST3), 1255(ST3), 1256(HW2), 1257 (IR1)[c], 1258(HW2)[c], 1259(ST3)[c].

JUNE: 1260(HY3), 1261(HY3), 1262(HY3), 1263(HY3), 1264(HY3), 1265(HY3), 1266(HY3), 1267(PO3), 1268 (PO3), 1269(SA3), 1270(SA3), 1271(SA3), 1272(SA3), 1273(SA3), 1274(SA3), 1275(SA3), 1276(SA3), 1277 (HY3), 1278(HY3), 1279(PL2), 1280(PL2), 1281(PL2), 1282(SA3), 1283(HY3)[c], 1284(PO3), 1285(PO3), 1286 (PO3), 1287(PO3)[c], 1288(SA3)[c].

JULY: 1289(SM3), 1290(EM3), 1291(EM3), 1292(EM3), 1293(EM3), 1294(HW3), 1295(HW3), 1296(HW3), 1297 (HW3), 1298(HW3), 1299(SM3), 1300(SM3), 1301(SM3), 1302(ST4), 1303(ST4), 1304(ST4), 1305(SU1), 1306 (SU1), 1307(SU1), 1308(ST4), 1309(SM3), 1310(SU1)[c], 1311(EM3)[c], 1312(ST4), 1313(ST4), 1314(ST4), 1315 (ST4), 1316(ST4), 1317(ST4), 1318(ST4), 1319(SM3)[c], 1320(ST4), 1321(ST4), 1322(EM3), 1323(AT1), 1324 (AT1), 1325(AT1), 1326(AT1), 1327(AT1), 1328(AT1)[c], 1329(ST4)[c].

AUGUST: 1330(HY4), 1331(HY4), 1332(HY4), 1333(SA4), 1334(SA4), 1335(SA4), 1336(SA4), 1337(SA4), 1338 (SA4), 1339(CO1), 1340(CO1), 1341(CO1), 1342(CO1), 1343(CO1), 1344(PO4), 1345(HY4), 1346(PO4)[c], 1347 (BD1), 1348(HY4)[c], 1349(SA4)[c] 1350(PO4), 1351(PO4).

SEPTEMBER: 1352(IR2), 1353(ST5), 1354(ST5), 1355(ST5), 1356(ST5), 1357(ST5), 1358(ST5), 1359(IR2), 1360 (IR2), 1361(ST5), 1362(IR2), 1363(IR2), 1364(IR2), 1365(WW3), 1366(WW3), 1367(WW3), 1368(WW3), 1369 (WW3), 1370(WW3), 1371(HW4), 1372(HW4), 1373(HW4), 1374(HW4), 1375(PL3), 1376(PL3), 1377(IR2)[c],1378 (HW4)[c], 1379(IR2), 1380(HW4), 1381(WW3)[c], 1382(ST5)[c], 1383(PL3)[c], 1384(IR2), 1385(HW4), 1386(HW4).

OCTOBER: 1387(CP2), 1388(CP2), 1389(EM4), 1390(EM4),1391(HY5), 1392(HY5), 1393(HY5), 1394(HY5), 1395 (HY5), 1396(PO5), 1397(PO5), 1398(PO5), 1399(EM4), 1400(SA5), 1401(HY5), 1402(HY5), 1403(HY5), 1404 (HY5), 1405(HY5), 1406(HY5), 1407(SA5), 1408(SA5), 1409(SA5), 1410(SA5), 1411(SA5), 1412(EM4), 1413 (EM4), 1414(PO5), 1415(EM4)[c], 1416(PO5)[c], 1417(HY5)[c], 1418(EM4), 1419(PO5), 1420(PO5), 1421(PO5), 1422(SA5)[c], 1423(SA5), 1424(EM4), 1425(CP2).

NOVEMBER: 1426(SM4), 1427(SM4), 1428(SM4), 1429(SM4), 1430(SM4)[c]. 1431(ST6), 1432(ST6), 1433(ST6), 1434(ST6), 1435(ST6), 1436(ST6), 1437(ST6), 1438(SM4), 1439(SM4), 1440(ST6), 1441(ST6), 1442(ST6)[c], 1443(SU2), 1444(SU2), 1445(SU2), 1446(SU2), 1447(SU2), 1448(SU2)[c].

DECEMBER: 1449(HY6), 1450(HY6), 1451(HY6), 1452(HY6), 1453(HY6), 1454(HY6), 1455(HY6), 1456(HY6)[c], 1457(PO6), 1458(PO6), 1459(PO6), 1460(PO6)[c], 1461(SA6), 1462(SA6), 1463(SA6), 1464(SA6), 1465(SA6), 1466(SA6)[c], 1467(AT2), 1468(AT2), 1469(AT2), 1470(AT2), 1471(AT2), 1472(AT2), 1473(AT2), 1474(AT2), 1475(AT2), 1476(AT2), 1477(AT2), 1478(AT2), 1479(AT2), 1480(AT2), 1481(AT2), 1482(AT2), 1483(AT2), 1484(AT2), 1485(AT2)[c], 1486(BD2), 1487(BD2), 1488(PO6), 1489(PO6), 1490(BD2), 1491(BD2), 1492(HY6), 1493(BD2).

VOLUME 84 (1958)

JANUARY: 1494(EM1), 1495(EM1), 1496(EM1), 1497(IR1), 1498(IR1), 1499(IR1), 1500(IR1), 1501(IR1), 1502 (IR1), 1503(IR1), 1504(IR1), 1505(IR1), 1506(IR1), 1507(IR1), 1508(ST1), 1509(ST1), 1510(ST1), 1511(ST1), 1512(ST1), 1513(WW1), 1514(WW1), 1515(WW1), 1516(WW1), 1517(WW1), 1518(WW1), 1519(ST1), 1520 (EM1)[c], 1521(IR1)[c], 1522(ST1)[c], 1523(WW1)[c], 1524(HW1), 1525(HW1), 1526(HW1)[c], 1527(HW1).

FEBRUARY: 1528(HY1), 1529(PO1), 1530(HY1), 1531(HY1), 1532(HY1), 1533(SA1), 1534(SA1), 1535(SM1), 1536(SM1), 1537(SM1), 1538(PO1)[c], 1539(SA1), 1540(SA1), 1541(SA1), 1542(SA1), 1543(SA1), 1544(SM1), 1545(SM1), 1546(SM1), 1547(SM1), 1548(SM1), 1549(SM1), 1550(SM1), 1551(SM1), 1552(SM1), 1553(PO1), 1554(PO1), 1555(PO1), 1556(PO1), 1557(SA1)[c], 1558(HY1)[c], 1559(SM1)[c].

MARCH: 1560(ST2), 1561(ST2), 1562(ST2), 1563(ST2), 1564(ST2), 1565(ST2), 1566(ST2), 1567(ST2), 1568 (WW2), 1569(WW2), 1570(WW2), 1571(WW2), 1572(WW2), 1573(WW2), 1574(PL1), 1575(PL1), 1576(ST2)[c], 1577(PL1), 1578(PL1)[c], 1579(WW2)[c].

APRIL: 1580(EM2), 1581(EM2), 1582(HY2), 1583(HY2), 1584(HY2), 1585(HY2), 1586(HY2), 1587(HY2), 1588 (HY2), 1589(IR2), 1590(IR2), 1591(IR2), 1592(SA2), 1593(SU1), 1594(SU1), 1595(SU1), 1596(EM2), 1597(PO2), 1598(PO2), 1599(PO2), 1600(PO2), 1601(PO2), 1602(PO2), 1603(HY2), 1604(EM2), 1605(SU1)[c],1606(SA2), 1607(SA2), 1608(SA2), 1609(SA2), 1610(SA2), 1611(SA2), 1612(SA2), 1613(SA2), 1614(SA2)[c], 1615(IR2)[c], 1616 (HY2)[c], 1617(SU1), 1618(PO2)[c], 1619(EM2)[c], 1620(CP1).

c. Discussion of several papers, grouped by divisions.

AMERICAN SOCIETY OF CIVIL ENGINEERS

OFFICERS FOR 1958

PRESIDENT

LOUIS R. HOWSON

VICE-PRESIDENTS

Term expires October, 1958:
FRANCIS S. FRIEL
NORMAN R. MOORE

Term expires October, 1959:
WALDO G. BOWMAN
SAMUEL B. MORRIS

DIRECTORS

Term expires October, 1958:
JOHN P. RILEY
CAREY H. BROWN
MASON C. PRICHARD
ROBERT H. SHERLOCK
R. ROBINSON ROWE
LOUIS E. RYDELL
CLARENCE L. ECKEL

Term expires October, 1959:
CLINTON D. HANOVER, Jr.
E. LELAND DURKEE
HOWARD F. PECKWORTH
FINLEY B. LAVERTY
WILLIAM J. HEDLEY
RANDLE B. ALEXANDER

Term expires October, 1960:
PHILIP C. RUTLEDGE
WESTON S. EVANS
TILTON E. SHELBURNE
CRAIG P. HAZELET
DONALD H. MATTERN
JOHN E. RINNE

PAST PRESIDENTS

Members of the Board

ENOCH R. NEEDLES

MASON G. LOCKWOOD

EXECUTIVE SECRETARY

WILLIAM H. WISELY

TREASURER

CHARLES E. TROUT

ASSISTANT SECRETARY

E. LAWRENCE CHANDLER

ASSISTANT TREASURER

CARLTON S. PROCTOR

PROCEEDINGS OF THE SOCIETY

HAROLD T. LARSEN
Manager of Technical Publications

PAUL A. PARISI
Editor of Technical Publications

FRANCIS J. SCHNELLER, JR.
Assistant Editor of Technical Publications

COMMITTEE ON PUBLICATIONS

HOWARD F. PECKWORTH, *Chairman*

PHILIP C. RUTLEDGE, *Vice-Chairman*

E. LELAND DURKEE
R. ROBINSON ROWE
TILTON E. SHELBURNE
LOUIS E. RYDELL